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IOT ENABLED PLANT

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Abstract: India is mainly an agricultural country. Agriculture is the most important occupation for the most of the Indian families. It plays vital role in the development of an agricultural country. In India, agriculture contributes about 16% of total GDP and 10% of total exports. Water is main resource for Agriculture. Irrigation is one method to supply water but in some cases there will be lot of water wastage. So, in this regard to save water and time we have proposed project titled automatic irrigation system using IoT. In this proposed system we are using various sensors like temperature, humidity, soil moisture sensors which senses the various parameters of the soil and based on soil moisture value land gets automatically irrigated by ON/OFF of the motor. These sensed parameters and motor status will be displayed on user android application

Keywords: Arduino control unit, Moisture Sensor, Temperature Sensor, Water Pump, Plant.

INTRODUCTION

Agriculture is the major source of income for the largest population in India and is a major contributor to Indian economy. However, technological involvement and its usability have to be grown and cultivated for the agro sector in India. Although few initiatives have also been taken by the Indian Government for providing online and mobile messaging services to farmers related to agricultural queries and agro vendor's information to farmers. Based on the survey it is observed that agriculture contributes 27% to GDP ,and Provides employment to 70% of Indian population. IoT is changing the agriculture domain and empowering farmers to fight with the huge difficulties they face. Agriculture must overcome expanding water deficiencies, restricted availability of lands, while meeting the expanding consumption needs of a world population. New innovative IoT applications are addressing these issues and increasing the quality, quantity, sustainability and cost effectiveness of agricultural production. Agriculture is the backbone of Indian Economy. In today's world, as we see rapid growth in global population, agriculture becomes more important to meet the needs of the human race. However, agriculture requires irrigation and with every year we have more water consumption than rainfall, it becomes critical for growers to find ways to conserve water while still achieving the highest yield. But in the present era, the farmers have been using irrigation techniques through manual control in which they irrigate the land at the regular interval. According to statistics, agriculture uses 85% of available freshwater resources worldwide, and this percentage will continue to be dominant in water consumption because of population growth and increased food demand. There is an urgent need to create strategies based on science and technology for sustainable use of water, including technical, agronomic, managerial and institutional improvements. Agricultural irrigation based on Internet technology is based on crop water requirement rules. By using Internet technology and sensor network technology we can control water wastage and to maximize the scientific technologies in irrigation methods. Hence it can greatly improve the utilization of water and can increase water productivity. IoT is changing the agriculture domain and empowering farmers to fight with the huge difficulties they face. Agriculture must overcome expanding water deficiencies, restricted availability of lands, while meeting the expanding consumption needs of a world population. New innovative IoT applications are addressing these issues and increasing the quality, quantity, sustainability and cost effectiveness of agricultural production. Agriculture is the backbone of Indian Economy. In today's world, as we see rapid growth in global population, agriculture becomes more important to meet the needs of the human race.

EXISTING SYSTEM & PROBLEMS OF EXISTING SYSTEM

The system is developed for irrigation is on two ways:
I) System Software
II) System hardware

Software is web page designed by using PHP and hardware consists of embedded system which monitors soil content. In this system open source Arduino boards along with moisture sensors, it is applicable to create devices that can monitor

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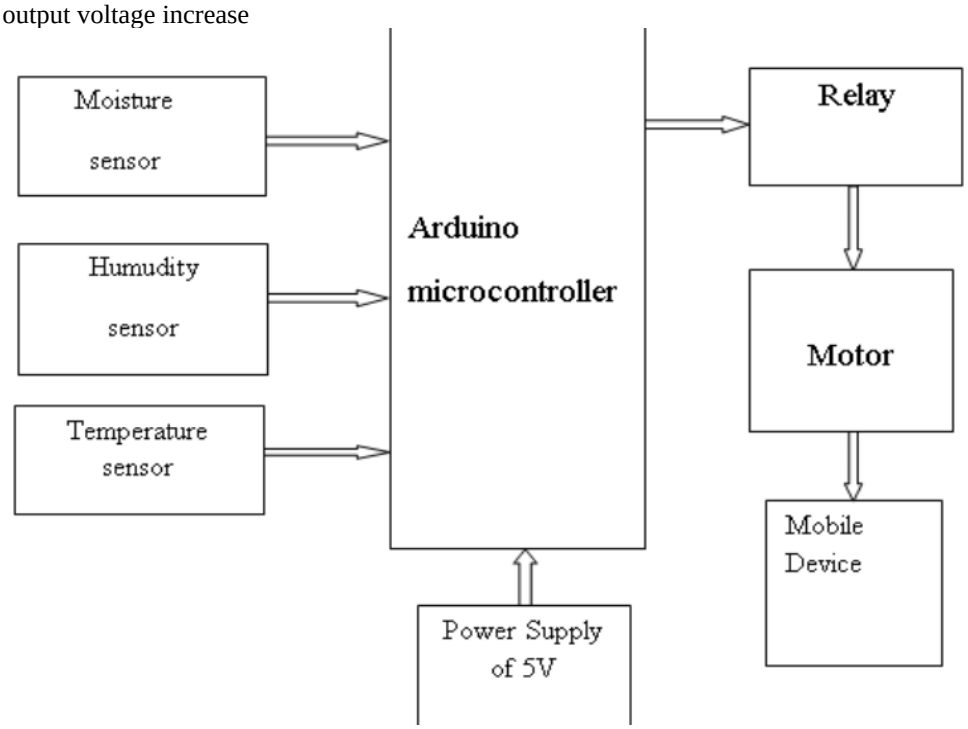
the soil moisture content and accordingly irrigating the fields as when needed. This system introduced a GSM-SMS remote measurement and control system for farms based on PC based database system connected with base station, which is developed by using a microcontroller, GSM module, actuators and sensors. It informs users about many conditions like status of electricity, dry running motor, increased /decreased temperature, water content in soil via SMS on GSM network or by Bluetooth. In practical the central station receives and sends messages through GSM module Values of temperature, air humidity and moisture which are set by the central station are measured in every base station information is exchanged between the far end and the designed system via SMS on GSM network. A SIM with 3G data pack inserted into the system which provides IOT features to the system. This system sets the irrigation time depending on reading from sensors and type of crop and it can automatically irrigate the field when needed, by using GSM-GPRS SIM900A parameter from a sensor regularly updated on a webpage. This application makes use of the GPRS feature of mobile phone as a solution for irrigation control systems. This system was used to cover a lower range of land and not economically affordable.

BENEFITS OF THE PROPOSED SYSTEM

Soil moisture sensor is used to detect the moisture of the soil. This sensor is made up of two pieces
the electronic board at the right, and the probe with two pads, that detects the moisture content of soil.
How does it work?
The voltage of the sensor outputs changes accordingly to the moisture level in the soil.
When the soil is:
Wet: The output voltage decrease
Dry: The output voltage increase



METHODS

Software Requirements: Java, Windows 10 or windows 8.
Hardware Requirements: Sensors (Moisture, DHT22, Ultrasonic) ESP8266 Wi-Fi, module, Arduino, Water pump

LITERATURE SURVEY

Primary investigation is carried out under the following stages, such as Understanding the existing approaches, Understanding the requirements, developing an abstract for the system. In this paper, soil moisture sensor, temperature and humidity sensors placed in the root zone of plant and transmit data to android application. Threshold value of soil moisture sensor that was programmed into a microcontroller to control water quantity. Temperature, humidity and soil moisture values are displayed on the android application. This paper on "Automatic Irrigation System on Sensing Soil

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Moisture Content" is intended to create an automated irrigation mechanism which turns the pumping motor ON and OFF on detecting the dampness content of the earth. In this paper only soil moisture value is considered but proposed project provided extension to this existed project by adding temperature and humidity values. Remote Monitoring in Agricultural Greenhouse Using Wireless Sensor and ShortMessage Service (SMS).In this paper they are sending data via sms but proposed system sends the values to mobile application. This proposed paper is arduino based remote irrigation system developed for the agricultural plantation, which is placed at the remote location and required water provides for plantation when the humidity of the soil goes below the set-point value.But in this we did not aware about the soil moisture level so to overcome this drawback proposed system included with extra feature soil moisture value and temperature value which displayed on the farmer mobile application Irrigation Control System Using Android and GSM for Efficient Use of Water And Power" this system made use of GSM to control the system which may cost more so to overcome that proposed system used arduino yun board which already consist of in build wifi module "Microcontroller based Controlled Irrigation System for Plantation" In this paper old generation with lesser memory microcontroller is used to control the system but proposed system made use of arduino yun board which is user friendly and it helps to dump the programs easily. A wireless application of drip irrigation automation supported by soil moisture sensors" in this paper irrigation is carried out using soil moisture values but extend to this proposed system displays temperature and humidity values. By referring all above papers it is found that no such systems are existed with all integrated features but proposed system includes these all features such as displaying

MODULE SPECIFICATION

We have divided our project into 4 modules. They are:
1. Object sensing sensor.
2. Process the information.
3. Result generation.
4. Evaluation.

ARCHITECTURAL DESIGN

Architectural design is defined as the process of defining a collection of hardware and software components and their interface to establish the framework for the development of a computer system. Architectural design is the identification and understanding of each component of the overall solution and how to components interacts to meet the system requirements**.** Architectural design is a concept that focuses on components or elements of a structure. An architect is generally the one in charge of the architectural design. They work with space and elements to create a coherent and functional structure There are several steps involved in the design process for an architectural project. Each step is very important to the overall look, feel, and safety of the project.

The steps are as follows:

Schematic Design: The first step of the design phase is the schematic design. The schematic design is where the architect gathers information on the needs, style, and wants for the project and from there the he will create two to three design options for the client to review.

Design Development: In the design development, the architect will take the schematic designs and develop them to an approved design concept. Any changes the client wants to make to the design should be communicated to the architect during this phase.

Construction Documents: Construction documents are given to a contractor for the construction of your project. An architect will put together drawings with a lot of detail on them for the contractors to follow when building

Bidding: Bidding is when the architect or client seeks a contractor for their project. They bid the job to the contractor by giving them bid documents which display details of the project. These documents include construction documents and technical specifications.

Block diagram: A **block diagram** is a specialized, high-level flowchart used in engineering. It is used to design new systems or to describe and improve existing ones. Its structure provides a high-level overview of major system components, key process participants, and important working relationships.

Below is the block diagram of our project.

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Block

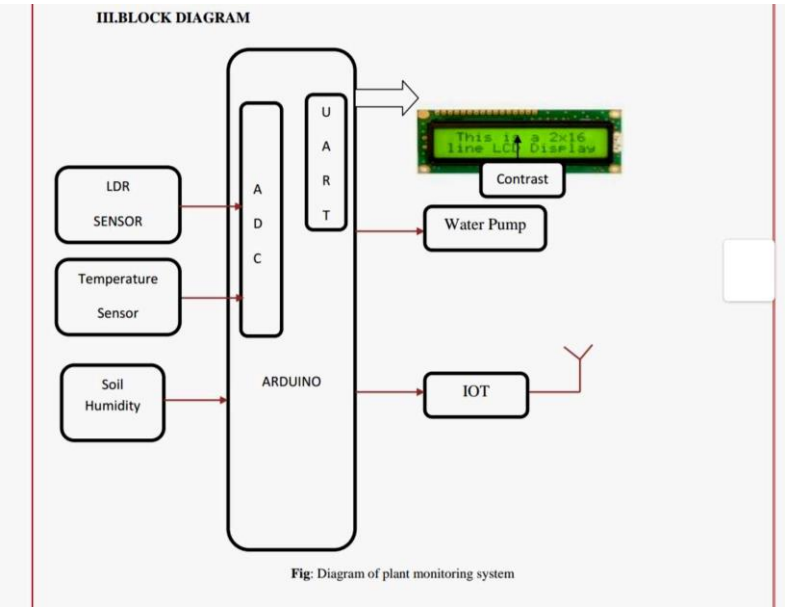

Fig: Diagram of plant monitoring system

Design Concepts for Our Project:
The set of fundamental software design concepts are as follows:
Abstraction:
● Environment at the highest level abstraction.
● The lower level of abstraction provides a more detailed description of the solution.
Patterns:
● A design pattern describes a design structure and that structure solves a particular design problem in a specified content.
● The application is designed using various patterns that allow perfect designs for easing the understanding of the application.
Modularity:
● Software is separately divided into name and addressable components sometime they are called as modules which integrate to satisfy the problem requirements.
● Modularity is the single attribute of software that permits a program to be managed easily.

ALGORITHM DESIGN

Step 1: Start
Step 2: Let us assume the water level of the plant..
Step 3: Here various sensors like soil moisture sensor for sensing the water level of the plant
Step 4: The sensors sense the water level of the soil.
Step 5: If the obstacle is a person then LDR and temperature sensors senses the Light and temperature of the soil.
Step 6: If the water level of the plant is ok then the motor will turn OFF.
Step 7: If the temperature level is low or dark then the temperature is updated through the ardunio control unit.
Step 8: If the water level is high then the motor will turn ON immediately
Step 9: the temperature and water levels of the plant is always updated to mobile application through ardunio control unit.
Step 10: Stop

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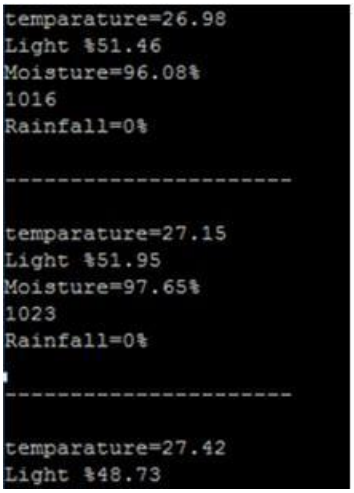
RESULTS



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USER MANUAL

A user guide or user's guide, also commonly known as manual, is a technical communication document intended to give assistance to people using a particular system.
We have nine steps. The following nine steps are:

Steps:

1. Let us assume the water level of the plant..
2. Here various sensors like soil moisture sensor for sensing the water level of the plant
3. Here various sensors like soil moisture sensor for sensing the water level of the plant
4. The sensors sense the water level of the soil.
5. If the obstacle is a person then LDR and temperature sensors senses the Light and temperature of the soil.
6. If the water level of the plant is ok then the motor will turn OFF.
7. If the temperature level is low or dark then the temperature is updated through the arduino.
8. If the water level is high then the motor will turn ON immediately

CONCLUSION

The project "IoT BASED AGRICULTURE FIELD MONITORING SYSTEM" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly, using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

ACKNOWLEDGEMENT

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